

Claims

I claim:

1. An articulated rail road car having a plurality of rail car units carried on a plurality of rail car trucks, said rail road car having a rolling direction defining a longitudinal direction, said plurality of rail car units including a first rail car unit and a second rail car unit connected together at an articulation connection, said rail car trucks including a first rail car truck located closer to said articulation connection than any other of said rail car trucks, said first rail car truck being pivotally mounted to said first rail car unit, and said articulation connection being longitudinally eccentrically mounted relative to said first truck.

2. The articulated rail road car of claim 1 wherein said first truck is a two axle truck mounted to pivot about a vertical truck center axis relative to said first car unit, and said articulation connection is cantilevered longitudinally relative to the truck center axis.

3. An articulated rail road car as claimed in claim 1 wherein said first and second rail car units have mutually engaging side bearing arms.

4. The articulated rail road car of claim 1 wherein said articulation connection has a first portion mounted to said first rail car unit, and a mating second portion mounted to said second rail car unit, said first and second portions meeting on a bearing interface defining a portion of a spherical surface.

5. The articulated rail road car of claim 4 wherein said articulation connection has a first portion mounted to said first rail car unit, and a mating second portion mounted to said second rail car unit, said articulation connection being capable of transferring a vertical shear load from said second portion to said first portion.

6. An articulated rail road car, said rail road car having a rolling direction, on tangent track, defining a longitudinal direction, and wherein:

said articulated rail road car includes at least first and second rail car units carried on rail car trucks, said first and second rail car units being joined at an articulated connection;

said first rail car unit has a first end proximate to said articulated connection, and a second end distant from said articulation connection;

said first rail car unit has a first of said rail car trucks pivotally mounted thereunder, said first rail car truck being closer to said articulation connection than any other of said rail car trucks;  
said first rail car truck being located closer to said first end of said first rail car unit than to said second end of said first rail car unit; and  
said articulation connection is longitudinally eccentric relative to said first rail car truck.

7. The articulated rail road car of claim 6 wherein:

said second rail car unit has a first end proximate to said articulation connection, and a second end distant from said articulated connection;  
said second rail car unit has a second rail car truck mounted thereunder, said second rail car truck being located closer to said second end of said second rail car unit than to said first end of said second rail car unit; and  
said second rail car unit is free of rail car trucks between said articulation connection and said second rail car truck.

8. The articulated rail road car of claim 6 wherein:

said articulation connection is a first articulation connection; and  
said rail road car has a third rail car unit joined to said second rail car unit at a second articulation connection.

9. The articulated rail road car of claim 6 wherein said second articulation connection is mounted eccentrically relative to said second rail car truck.

10. The articulated rail road car of claim 6 wherein:

said articulation connection is a first articulation connection;  
said rail road car has a third rail car unit joined to said second rail car unit at a second articulation connection;  
said third rail car unit has a first end proximate to said second articulated connection, and a second end distant from said second articulated connection;  
said third car unit has a second rail car truck mounted thereunder, said second rail car truck being located closer to said first end of said third rail car unit than to said second end of said third rail car unit; and  
said second articulated connection is longitudinally eccentric relative to said

second rail car truck.

11. The articulated rail road car of claim 10 wherein said rail road car is free of trucks between said first articulation connection and said second articulation connection.

12. The articulated rail road car of claim 10 wherein said rail road car is free of trucks between said first and second trucks.

13. The articulated rail road car of claim 6 wherein:  
said first rail car unit is supported by a second rail car truck; and  
said second rail car truck is located closer to said second end of said first rail car unit than to said second end of said first rail car unit.

14. The articulated rail road car of claim 6 wherein:  
said articulation connection is a first articulation connection;  
said rail road car includes a third rail car unit joined to said first end of said first rail car unit at a second articulation connection;  
a second of said rail car trucks is pivotally mounted under said second end of said first rail car unit;  
said second rail car unit has a first end proximate to said first articulation connection, and a second end distant from said first articulated connection;  
a third of said rail car trucks is mounted under said second end of said second rail car unit; and  
said third rail car unit has a first end proximate to said second articulation connection, and a second end distant from said second articulated connection; and  
a fourth of said rail car trucks is mounted under said second end of said third rail car unit.

15. The articulated rail road car of claim 14 wherein said rail road car is a three-pack articulated rail road car, said first rail car unit is a two truck middle car unit, and said second and third rail car units are single truck end units each having a releasable coupler mounted as the respective second ends thereof.

16. The articulated rail road car of claim 14 wherein:  
said first rail car unit and said second rail car unit have mutually engaging side

bearing arms mounted thereto; and  
said first rail car unit and said third rail car unit have mutually engaging side  
bearing arms mounted thereto.

17. The articulated rail road car of claim 14 wherein said second articulation  
connection is longitudinally eccentrically located relative to said second rail car truck.

18. The rail road car of claim 6 wherein:  
said first rail car truck has a first pair of wheels mounted on a first axle, and a  
second pair of wheels mounted on a second axle;  
said first axle being longitudinally outboard relative to said second axle; and  
said articulation connection being longitudinally outboard relative to said first  
axle.

19. The rail road car of claim 6 wherein said first car unit has side bearing arms  
extending from said first end thereof toward said second car unit; and said second car unit  
has side bearing arms extending therefrom to engage said side bearing arms of said first  
car unit.

20. The rail road car of claim 6 wherein said side bearing arms of said first car unit  
have bearing surfaces facing upward, and said side bearing arms of said second car unit  
have bearing surfaces facing downward.

21. The rail road car of claim 6 wherein:  
said first car unit has a main bolster mounted over said first truck, and a center sill  
extending longitudinally outboard therefrom;  
said center sill has a distal end longitudinally distant from said main bolster; and  
said articulation connection is mounted to said distal end of said center sill.

22. The rail road car of claim 21 wherein said center sill is a stub center sill.

23. The rail road car of claim 22 wherein said first rail car unit has a well intermediate  
said first and second ends thereof.

24. The rail road car of claim 21 wherein said center sill is a through center sill  
extending between said first and second ends of said first rail car unit.

25. The articulated rail road car of claim 6 wherein:  
said first rail car unit has a main bolster mounted above said first truck, a center  
sill extending longitudinally outboard of said first truck toward said second  
rail car unit, and an endmost lateral structural member extending  
transversely relative to said center sill, said end bolster being located  
longitudinally outboard of said main bolster; and  
said center sill has a distal end outboard of said endmost lateral structural member  
to which said articulation connection is mounted.

26. The articulated rail road car of claim 25 wherein:  
said first car unit has longitudinally extending members located transversely  
outboard and to either side of said center sill;  
said longitudinally extending members run between said main bolster and said  
endmost lateral structural member;  
said longitudinally extending members extend longitudinally beyond said endmost  
lateral structural member to define a first pair of side bearing arms; and  
said second rail car unit has a second pair of side bearing arms mounted thereto,  
said second pair of side bearing arms being located to engage said first pair  
of side bearing arms.

27. The articulated rail road car of claim 25 wherein:  
said first rail car unit has longitudinally extending side sills connected to said  
main bolster and said endmost lateral structural member;  
said first car unit has longitudinally extending members each located intermediate  
said center sill and a respective one of said side sills;  
said longitudinally extending members run between said main bolster and said  
endmost lateral structural member,  
said longitudinally extending members extend longitudinally outboard beyond  
said endmost lateral structural member to define a first pair of side bearing  
arms; and  
said second rail car unit has a second pair of side bearing arms mounted thereto,  
said second pair of side bearing arms being located to engage said first pair  
of side bearing arms.

28. An articulated rail road car wherein:

said rail road car has first and second rail car units joined at an articulation connection;

said rail road car has a plurality of rail car trucks to permit said rail road car to proceed in a rolling direction along rail road tracks, said rolling direction defining a longitudinal direction;

said first rail car unit has a first end proximate said articulation connection and a second end distant from said articulation connection;

said first rail car unit is mounted upon a pair of said rail car trucks, said pair being first and second rail car trucks located under said first and second ends of said first rail car unit respectively, and being pivotable relative thereto about truck center axes;

said first and second rail road car trucks being separated by a truck center distance of at least 46 ft. 3 in.;

said articulation connection being closer to said first rail car truck than to any other rail car truck;

said first rail car unit has a pair of first and second bolsters located at either end thereof, said bolsters being mounted over said first and second rail car trucks respectively;

said first rail car unit has a center sill extending outboard of said first bolster toward said second rail car unit, said center sill having an outboard end; and

said articulation connection is mounted to said outboard end of said center sill.

29. The articulated rail road car of claim 28 wherein:

said second rail car unit has a first end proximate said articulation connection and a second end distant from said articulation connection;

said second rail car unit is mounted upon a third rail car truck located under said second end of said second rail car unit; and

said second rail car unit is free of trucks between said third rail car truck and said articulation connection.

30. The articulated rail road car of claim 29 wherein:

said articulated connection is a first articulation connection;

said rail road car has a third rail car unit connected to said second rail car unit at a second articulation connection;

said second rail car unit has a main bolster mounted above said third rail car truck;

said second rail car unit has a center sill extending outboard of said third rail car truck toward said third rail car unit, said center sill of said second rail car truck having a distal end distant from said third truck; and  
said second articulation connection is mounted to said distal end of said center sill of said second rail car unit.

31. The articulated rail road car of claim 29 wherein :  
said third rail car unit has a first end proximate said second articulation connection and a second end distant from said second articulation connection;  
said third rail car unit is mounted upon a fourth rail car truck located under said second end of said third rail car unit; and  
said third rail car unit is free of trucks between said fourth rail car truck and said second articulation connection.

32. The articulated rail road car of claim 28 wherein:  
said articulation connection is a first articulation connection, said outboard end of said center sill is a first end thereof; and  
said rail road car has a third rail car unit connected to said second end of said first rail car unit at a second articulation connection.

33. The articulated rail road car of claim 32 wherein:  
said center sill is a through center sill having a second end located outboard of said second main bolster; and  
said second articulation connection is mounted to said second end of said center sill.

34. The articulated rail road car of claim 33 wherein:  
said third rail car unit has a first end proximate said second articulation connection and a second end distant from said second articulation connection;  
said third rail car unit is mounted upon a fourth rail car truck located under said second end of said third rail car unit; and  
said third rail car unit is free of trucks between said fourth rail car truck and said second articulation connection.

35. An articulated rail road car wherein:  
said articulated rail road car has at least a first rail car unit, a second rail car unit,

and a third rail car unit, said second rail car unit lying between said first and third rail car units;  
said articulated rail road car has a number of rail car trucks mounted to support said rail car units;  
said first rail car unit is connected to said second rail car unit at a first articulation connection;  
said second rail car unit is connected to said third rail car unit at a second articulation connection; and  
none of said rail car trucks is mounted centrally under either of said first and second articulation connections.

36. The articulated rail road car of claim 35 wherein said rail road car is free of trucks between said first and second articulation connections.

37. The articulated rail road car of claim 36 wherein each of said first and third rail car units is supported by a spaced apart pair of said rail car trucks mounted thereunder.

38. The articulated rail road car of claim 36 wherein each of said first and third rail car units has a cantilever member extending toward said second rail car unit, and said first and second articulation connections are mounted respectively to said cantilever members of said first and third rail car units.

39. The articulated rail road car of claim 36 wherein:  
a fourth rail car unit is connected to said third rail car unit at a third articulated connection;  
said third rail car unit has a first end adjacent said second articulation connection and a second end adjacent said third articulation connection;  
said first rail car unit is supported by a pair of said rail car trucks, namely first and second spaced apart rail car trucks mounted thereunder, none of said trucks being mounted centrally under said third articulation connection; and  
a third one of said rail car trucks is mounted under said first end of said third rail car unit.

40. The articulated rail road car of claim 36 wherein:  
a fourth rail car unit is connected to said first rail car unit at a third articulated connection;



a fifth rail car unit is connected to said third rail car unit at a fourth articulated connection;  
said first rail car unit has a first end adjacent said first articulation connection and a second end adjacent said third articulation connection;  
said third rail car unit has a first end adjacent said second articulation connection and a second end adjacent said fourth articulation connection;  
none of said rail car trucks is mounted centrally under said third articulation connection;  
none of said rail car trucks is mounted centrally under said fourth articulation connection;  
a first of said rail car trucks is mounted under said first end of said first rail car unit; and  
a second of said rail car trucks is mounted under said first end of said third rail car unit.

41. An articulated rail road car wherein, when standing on tangent track:  
said rail road car has a first rail car unit and a second rail car unit, said first and second rail car units being joined at an articulation connection;  
each of said first and second rail car units has a proximal end near to said articulated connection, and a distal end lying away from said articulated connection;  
the distal end of said first rail car unit is supported by a first rail car truck;  
the distal end of said second rail car unit is supported by a second rail car truck;  
a third rail car truck is pivotally mounted to said rail road car between said first and second trucks, said rail road car being free of trucks between said first and third trucks, and being free of trucks between said third truck and said second truck;  
said third truck being spaced from said first truck a first distance,  $D_1$ ;  
said articulation connection being spaced from said first truck a second distance,  $D_2$ ; and  
said first distance,  $D_1$ , being less than said second distance,  $D_2$ .
42. The articulated rail road car of claim 41 wherein:  
said third truck is spaced from said second truck a third distance,  $D_3$ ; and  
 $D_3$  is different from  $D_1$ .

43. The articulated rail road car of claim 42 wherein  $D_3$  is greater than  $D_1$ .
44. The articulated rail road car of claim 41 wherein:  
said third truck is spaced from said articulated connection a third distance,  $D_3$ ;  
said second truck is spaced from said articulated connection a fourth distance,  $D_4$ ;  
and  
 $D_4$  is greater than  $D_3$ .
45. The articulated rail road car of claim 41 wherein said third rail car truck is pivotally mounted to said first rail car unit and said first distance,  $D_1$ , is at least 46 ft. - 3 in.
46. An articulated rail road freight car comprising at least first and second rail car units connected at a cantilevered articulation.
47. The articulated rail road freight car of claim 46 wherein said first and second rail car units each have at least one deck upon which vehicles can be loaded.
48. The articulated rail road freight car of claim 47 further comprising at least one member mounted to permit vehicles to be conducted between said first and second rail car units.
49. The articulated rail road freight car of claim 47 further comprising bridge plates mounted to permit vehicles to be driven from said first rail car unit to said second rail car unit.
50. The articulated rail road freight car of claim 46 wherein said first and second rail car units have mutually engaging side bearing arms.
51. The articulated rail road freight car of claim 46 wherein said rail road car is an auto-rack car.
52. The articulated rail road freight car of claim 51 further comprising bridge plates mounted to permit automobiles to be conducted between said first and second rail car units

53. The articulated rail road freight car of claim 51 wherein said first and second rail car units have mutually engaging side bearing arms.
54. The articulated rail road freight car of claim 46 wherein at least one of said first and second rail car units is a well car unit.
55. The articulated rail road freight car of claim 46 wherein said freight car is a three pack rail road car having a two truck middle unit and a pair of single truck end units.
56. The articulated rail road freight car of claim 46 wherein said freight can has first and second ends, and releasable couplers mounted at said first and second ends, said releasable couplers being operable to permit interchangeable operation with other rail road freight cars in North American service.